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## **SOILS APPENDIX**



## SOILS APPENDIX

The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Services (NRCS) has published a general soil association map for Montana in digital format. The State Soil Geographic Database (USDA NRCS 1996) provides a general overview of soils distribution and occurrences in the planning area, and is not suitable for site-specific evaluations. More detailed information is available from the NRCS Regional offices in Montana. General soils information presented in the State Soil Geographic Database is presented in the *Soils Technical Report* (ALL 2001a). Information presented includes the areal extent, soil series characteristics, K-factor (erosion potential), salinity, and sodium adsorption ratio (SAR) for the various soil groups in the Powder River RMP and Billings RMP areas. The *Soils Technical Report* was prepared to present the potential impacts from the coal bed methane (CBM) extraction process on land and the environment, with a focus on impacts to agriculture, and including potential effects on crops, livestock, and soils. The report was used to prepare this section and provides more detailed information pertaining to soils and CBM development impacts to the environment. The complete Soils Technical Report can be accessed at <http://www.mt.blm.gov/mcfo>.

The layout of the soils in the study area is shown in Figures SOI-1 and SOI-2 for the Billings Resource Management Plan (RMP) Area and Powder River RMP area, respectively. A total of 163 soil mapping units composed of 205 soil series are present in the two RMP areas. The seven principal soil mapping units based on areal extent within the two RMP areas are:

- MT421 Cambeth-Megonot-Manning  
(4.3 percent)
- MT089 Yamac-Birney-Cabbart  
(4.3 percent)
- MT676 Yawdim-Delpoint-Thurlow  
(4.0 percent)
- MT675 Cabbart-Yawdim-Thurlow  
(3.9 percent)
- MT384 Marvan-Neldore-Bascovy  
(3.5 percent)
- MT103 Cabbart-Delpoint-Yamac  
(3.0 percent)
- MT559 Tanna-Rentsac-Yawdim  
(2.9 percent)

These seven soil mapping units comprise 26 percent of the two RMP areas, with the remaining 156 soil

mapping units making up the remainder. Table SOI-1 presents all of the soil mapping units in the Billings RMP and Powder River RMP areas, along with the percent of the total RMP areas occupied by each mapping unit. Table SOI-2 presents some of the key soil characteristics related to erosion and salinity for the topmost 25 mapping units based on percent of total area.

Soils in the RMP areas are derived mainly from sedimentary bedrock and alluvium. The soils generally range from loams to clays, but are principally loams to silty clay loams.

Slope and K-factor are values that are used in the estimation of soil erosion potential. Slope values range up to greater than 40 percent; however, there are many soils that have slopes of zero to about 10 percent. Almost all of the soils have low K-factors (below 0.37). Easily eroded soils have a K-factor between 0.37 and 0.69, and resistant soils have a K-factor less than 0.37 (Jarrett 1995). Figures presenting the mean K-factor of the soils in the Billings RMP and Powder River RMP areas are included in the *Soils Technical Report* (ALL 2001). Figures SOI-1 and SOI-2 are included here to summarize the information.

Soil salinity affects the suitability of a soil for crop production and the stability of the soil. The SAR is the measure of sodium relative to calcium and magnesium, and affects the soil structure and infiltration rate of water. The *Soils Technical Report* presents a more detailed discussion pertaining to the salinity and SAR of the soils in the Billings RMP and Powder River RMP areas. As shown in Table SOI-2, most of the soils are very low in salinity. The SAR values in the study areas and statewide vary widely and, with few exceptions, are low in sodium. Based on the generally fine texture of the surface soils (clayey), much of the soil will likely be susceptible to increasing sodicity when irrigated with water having a high SAR. Permeability is the measure of vertical water movement when the soil is saturated. The soil structure, porosity, gradation and texture all influence the permeability of the soil. Those soils with a coarser texture (sandy to loamy) and good internal drainage (higher permeability) will be the least susceptible to increasing sodicity and salinity. Much of the soil is likely to be irrigable with good management.

## SOILS APPENDIX

**TABLE SOI-1**  
**AREAL EXTENT OF SOIL MAP UNITS FOR POWDER RIVER AND BILLINGS RMP AREAS**

<b>STATSGO Map Unit</b>	<b>Map Unit Name</b>	<b>Acres</b>	<b>Percent of Area</b>
MT001	Abac-Peritsa-Rock Outcrop	93,754	0.48
MT003	Absarokee-Castner-Sinnigam	436,268	2.25
MT004	Absarokee-Wayden-Redcreek Family	23,322	0.12
MT006	Absarokee-Castner-Grail	15,901	0.08
MT007	Absarokee-Hilger-Big Timber	70,560	0.36
MT016	Winler-Lismas-Swanboy	21,332	0.11
MT017	Archin-Twilight-Bonfri	78,323	0.4
MT019	Assinniboine-Pring-Archin	459,121	2.37
MT024	Badland-Bullock-Neldore	129,347	0.67
MT027	Bainville-Mcrae-Rock Outcrop	453,939	2.35
MT028	Bainville-Rock Outcrop-Travessilla	205,254	1.06
MT029	Bainville-Travessilla Family-Evanston	171,636	0.89
MT037	Beauvais-Hydro-Lambeth	83,773	0.43
MT041	Bew-Toluca-Nobe	8,032	0.04
MT042	Big Timber-Cabba-Absarokee	107,565	0.56
MT048	Bitton-Shambo-Doney	428,667	2.22
MT051	Blackhall-Twilight-Zeona	21,144	0.11
MT054	Cabbart-Bonfri-Cambeth	2	<0.01
MT055	Bonfri-Gerdrum-Galbreth	3,927	0.02
MT070	Bryant-Doney-Shambo	56,522	0.29
MT075	Yamac-Busby-Cabbart	104,872	0.54
MT076	Cabba-Travessilla Family-Birney	121,597	0.63
MT078	Cabba-Campspass-Farland	6,969	0.04
MT080	Cabba-Farland-Yawdim	38,170	0.2
MT083	Cabba-Ringling-Yawdim	300,378	1.55
MT084	Cabba-Ringling-Yawdim	493,159	2.55
MT089	Yamac-Birney-Cabbart	827,152	4.27
MT090	Cabbart-Cambeth-Bonfri	183,942	0.95
MT092	Delpoint-Cabbart-Yamac	552,861	2.86

**TABLE SOI-1**  
**AREAL EXTENT OF SOIL MAP UNITS FOR POWDER RIVER AND BILLINGS RMP AREAS**

<b>STATSGO Map Unit</b>	<b>Map Unit Name</b>	<b>Acres</b>	<b>Percent of Area</b>
MT095	Cabbart-Keiser-Dast	57,076	0.29
MT096	Cabbart-Pultney Family-Stormitt	43,281	0.22
MT097	Cabbart-Rentsac-Delpoint	283,471	1.46
MT099	Cabbart-Rock Outcrop-Twilight	116,567	0.6
MT100	Cabbart-Twilight-Forelle	31,738	0.16
MT103	Cabbart-Delpoint-Yamac	577,016	2.98
MT112	Castner-Savage-Chama	5,667	0.03
MT113	Castner-Chama-Regent	4,089	0.02
MT114	Castner-Darret-Windham	3	<0.01
MT120	Wayden-Castner-Cabba	47,803	0.25
MT127	Chinook-Archin-Delpoint	6	<0.01
MT145	Crago-Musselshell-Attewan	545,006	2.82
MT146	Crago-Musselshell-Fairfield	7,046	0.04
MT148	Creed-Gerdrum-Forelle	1,072	0.01
MT152	Cushman-Yawdim-Bainville	54,706	0.28
MT153	Danvers-Tinsley-Oburn	72,675	0.38
MT155	Danvers-Judith-Windham	49,063	0.25
MT157	Dast-Forelle-Delpoint	31,137	0.16
MT159	Dast-Mcrae-Travessilla Family	84,373	0.44
MT161	Degrand-Kremlin-Ethridge	10,319	0.05
MT164	Cabbart-Delpoint-Yamac	278,907	1.44
MT165	Delpoint Family-Kirby-Delpoint	33,440	0.17
MT167	Delpoint-Travessilla Family-Cabbart	216,026	1.12
MT168	Delpoint-Cabbart-Yamac	105,771	0.55
MT173	Dolus-Boxwell-Castner	22,680	0.12
MT174	Doney-Reeder-Cabba	72,377	0.37
MT175	Doney-Shaak-Wayden	232,912	1.2
MT176	Doney-Winifred-Wayden	73,711	0.38
MT182	Starley-Rock Outcrop-Babb	147,700	0.76

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**TABLE SOI-1**  
**AREAL EXTENT OF SOIL MAP UNITS FOR POWDER RIVER AND BILLINGS RMP AREAS**

<b>STATSGO Map Unit</b>	<b>Map Unit Name</b>	<b>Acres</b>	<b>Percent of Area</b>
MT187	Ethridge-Kremlin-Marias	9,089	0.05
MT190	Evanston-Lonna-Tinsley	19,800	0.1
MT193	Fairway Family-Tetonview-Villy	8,546	0.04
MT209	Forkwood-Vonalee-Haverdad	31,675	0.16
MT213	Garlet-Cowood-Rock Outcrop	298	<0.01
MT216	Garlet-Rubble Land-Cowood	2,132	0.01
MT217	Garlet-Sebud-Cheadle	22,544	0.12
MT218	Shadow-Garlet-Macfarlane	257,150	1.33
MT224	Gerdrum-Forelle-Archin	38,201	0.2
MT225	Harlem-Gerdrum-Ethridge	26,205	0.14
MT228	Gilt Edge-Absher-Yawdim	11,675	0.06
MT247	Harlem-Vanda-Marvan	10,450	0.05
MT249	Stormitt-Harvey Family-Nihill	48,815	0.25
MT252	Haverson-Heldt-Toluca	16,832	0.09
MT254	Havre-Glendive-Water	30,577	0.16
MT255	Havre-Harlem-Attewan	25,454	0.13
MT256	Havre-Harlem-Glendive	88,473	0.46
MT258	Havre-Ryell-Harlem	50,431	0.26
MT259	Havre-Hanly-Glendive	173,933	0.9
MT261	Havre-Rivra-Water	114,549	0.59
MT263	Havre-Kobar-Spinekop	47,424	0.25
MT264	Havre-Glendive-Yamac	10,938	0.06
MT269	Heath-Charles-Maurice	58,449	0.3
MT271	Heldt-Fort Collins-Kobar	43,967	0.23
MT273	Helmvile-Whitore-Tropal	126,307	0.65
MT301	Keiser-Hydro-Gilt Edge	112,102	0.58
MT309	Kobar-Yamac-Attewan	23,490	0.12
MT321	Lamedeer-Ringling-Twin Creek	35,383	0.18
MT323	Lap-Windham-Armington	104,714	0.54

**TABLE SOI-1**  
**AREAL EXTENT OF SOIL MAP UNITS FOR POWDER RIVER AND BILLINGS RMP AREAS**

<b>STATSGO Map Unit</b>	<b>Map Unit Name</b>	<b>Acres</b>	<b>Percent of Area</b>
MT324	Lardell-Mckenzie-Kobar	28,542	0.15
MT327	Libeg-Leavitt-Hanson	17,866	0.09
MT336	Lihen-Delpoint-Tinsley	5,762	0.03
MT338	Lisam-Abor-Vanda	303,030	1.57
MT339	Lisam-Abor-Hesper	28,331	0.15
MT349	Lolo-Work-Shawa	39,683	0.21
MT365	Maginnis-Absarokee-Rock Outcrop	116,071	0.6
MT369	Marias-Havre-Harlem	143,781	0.74
MT374	Martinsdale-Fairfield-Reeder	7	<0.01
MT379	Marvan-Abor-Neldore	97,192	0.5
MT382	Marvan-Gerdrum-Vanda	200,503	1.04
MT383	Harlem-Vanda-Marvan	23,594	0.12
MT384	Marvan-Neldore-Bascovy	677,263	3.5
MT393	Mcrae-Harlem-Keiser	103,536	0.54
MT396	Midway-Shingle-Rock Outcrop	76,447	0.4
MT400	Mirror-Bross-Vasquez	56,548	0.29
MT407	Moyerson-Rock Outcrop-Orinoco	253,541	1.31
MT414	Neldore-Abor-Vanda	7,787	0.04
MT415	Neldore-Abor-Volborg	93,856	0.49
MT421	Cambeth-Megonot-Manning	829,387	4.29
MT433	Nunn-Toluca-Heldt	5,480	0.03
MT438	Bridger-Bynum-Owen Creek	16,109	0.08
MT456	Pinelli-Glendive-Busby	4,780	0.02
MT459	Prospect-Sublette-Teton	9,292	0.05
MT466	Reeder Family-Barvon-Mowbray	136,554	0.71
MT471	Rentsac-Cabbart-Blackhall	24,662	0.13
MT472	Yawdim-Rentsac-Lambeth	149,344	0.77
MT474	Broadus-Ridge-Cabba	42,375	0.22
MT475	Ringling-Cabba-Relan	16,537	0.09

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<b>STATSGO Map Unit</b>	<b>Map Unit Name</b>	<b>Acres</b>	<b>Percent of Area</b>
MT484	Rock Outcrop-Dryadine-Rubble Land	3,611	0.02
MT485	Garlet-Rock Outcrop-Cryoborolls	21,066	0.11
MT486	Rock Outcrop-Hanson-Whitecow	159,584	0.82
MT488	Rock Outcrop-Midway-Travessilla Family	236,799	1.22
MT489	Abor-Rock Outcrop-Delpoint	17,571	0.09
MT492	Rock Outcrop-Rubble Land-Cowood	127,770	0.66
MT497	Rock Outcrop-Water-Rubble Land	68,075	0.35
MT499	Romberg-Calicott-Hiland	28,655	0.15
MT500	Romberg-Naturita-Heldt	40,683	0.21
MT519	Savage-Forelle-Frazer	68,982	0.36
MT522	Savage-Work-Chama	4,497	0.02
MT532	Shadow-Garlet-Water	48,413	0.25
MT538	Skaggs-Starley-Raynesford	25	<0.01
MT547	Garlet-Stemple-Tigeron	1,244	0.01
MT550	Sweetgrass-Hilger-Fairfield	227,202	1.17
MT555	Tamaneen-Judith-Windham	53,564	0.28
MT559	Tanna-Rentsac-Yawdim	567,531	2.93
MT569	Yawdim-Thurlow-Cabbart	116,568	0.6
MT572	Tigeron-Garlet-Worock	142,349	0.74
MT575	Tinsley-Keiser-Yawdim	141,874	0.73
MT588	Work-Turner-Wayden	149,865	0.77
MT590	Twilight-Blackhall-Busby	22,004	0.11
MT594	Vananda-Gerdrum-Mckenzie	60,705	0.31
MT597	Vanstel-Cabbart-Delpoint	72,598	0.38
MT612	Wanetta-Hesper-Bitton	30,042	0.16
MT617	Wayden-Abac-Rock Outcrop	91,333	0.47
MT618	Wayden-Regent-Doney	82,113	0.42
MT619	Wayden-Eltsac-Maschetah	186,591	0.96
MT623	Whitecow-Mocmont-Hughesville	41,880	0.22

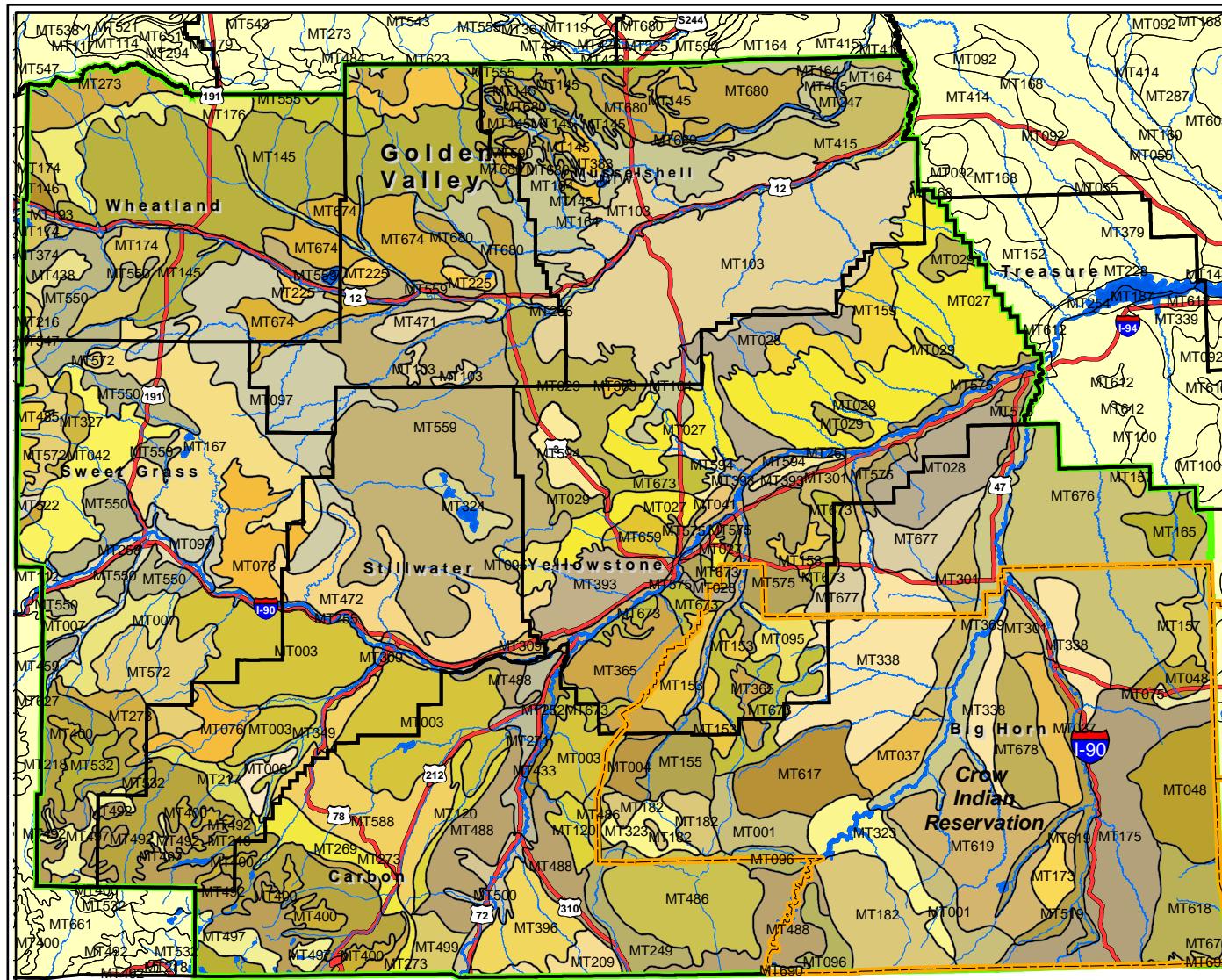
**TABLE SOI-1**  
**AREAL EXTENT OF SOIL MAP UNITS FOR POWDER RIVER AND BILLINGS RMP AREAS**

<b>STATSGO Map Unit</b>	<b>Map Unit Name</b>	<b>Acres</b>	<b>Percent of Area</b>
MT659	Wormser-Lavina-Yawdim	29,616	0.15
MT661	Worock-Garlet-Rock Outcrop	3,050	0.02
MT668	Yamac-Havre-Birney	211,006	1.09
MT669	Yamac-Kobar-Marvan	22,214	0.11
MT673	Yawdim-Abor-Vananda	179,618	0.93
MT674	Cabbart-Yawdim-Delpoint	147,969	0.76
MT675	Cabbart-Yawdim-Thurlow	758,425	3.92
MT676	Yawdim-Delpoint-Thurlow	770,758	3.98
MT677	Yawdim-Delpoint-Gerdrum	82,348	0.43
MT678	Yawdim-Ethridge-Rock Outcrop	70,647	0.37
MT679	Cabbart-Yawdim-Hesper	189,351	0.98
MT680	Yawdim-Orinoco-Amherst	214,696	1.11
MT690	Welring-Clifterson-Shavano	2,718	0.01
MT691	Ulm-Maggin-Louviers	7,403	0.04
MT692	Shingle-Renohill-Ulm	36,589	0.19
MT693	Samday-Shingle-Parmleed	7,705	0.04
MT694	Orella-Epsie-Winler	26,102	0.13
MT695	Haverdad-Havre-Zigweid	14,472	0.07

Source: USDA NRSC State Soil Geographic Database 1996

## SOILS APPENDIX

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## SOI-1: STATSGO Soils Types Billings RMP Area

### Legend

- Rivers
- Highways
- Billings RMP Area
- Native American Reservations

### Map Unit

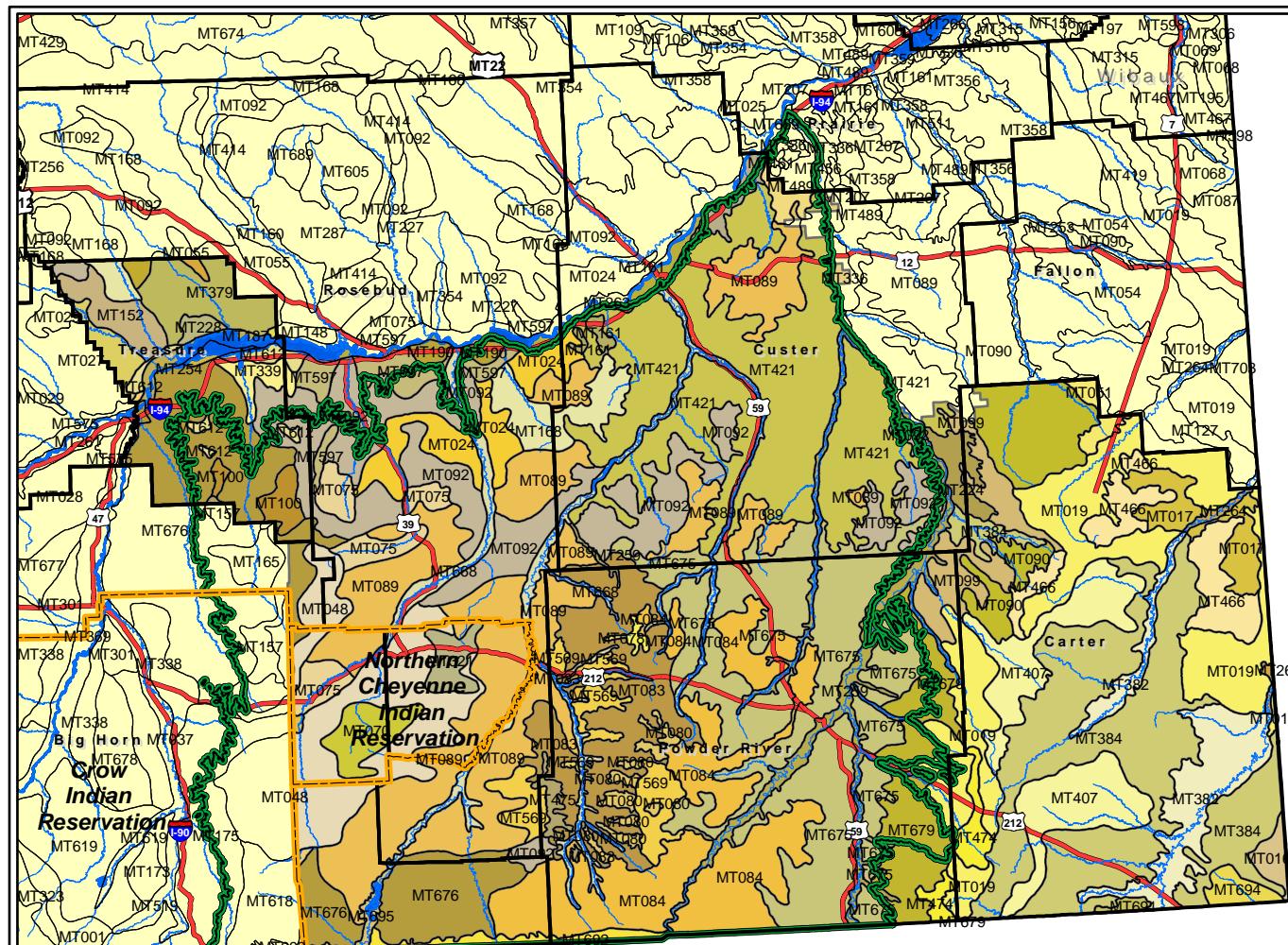
MT001	MT176	MT472
MT003	MT182	MT484
MT004	MT193	MT485
MT006	MT209	MT486
MT007	MT213	MT488
MT027	MT216	MT492
MT028	MT217	MT497
MT029	MT218	MT499
MT037	MT225	MT500
MT041	MT247	MT519
MT042	MT249	MT522
MT048	MT252	MT532
MT075	MT255	MT538
MT076	MT256	MT547
MT092	MT258	MT550
MT095	MT261	MT555
MT096	MT269	MT559
MT097	MT271	MT572
MT100	MT273	MT575
MT103	MT275	MT588
MT112	MT309	MT590
MT113	MT323	MT594
MT114	MT324	MT617
MT120	MT327	MT618
MT145	MT338	MT619
MT146	MT349	MT623
MT152	MT365	MT659
MT153	MT369	MT661
MT155	MT374	MT673
MT157	MT383	MT674
MT159	MT393	MT676
MT164	MT396	MT677
MT165	MT400	MT678
MT167	MT415	MT680
MT168	MT433	MT680
MT173	MT438	MT693
MT174	MT459	MT7W
MT175	MT471	

### DATA SOURCES

Counties: 1:100,000 scale, counties, Montana State Library/NRIS, Helena, Montana.  
 Highways: 1:100,000 scale, roads, Montana State Library/NRIS, Helena, Montana.  
 Reservations: 1:100,000 scale, reservations, Montana State Library/NRIS, Helena, Montana.  
 Rivers: 1:100,000 scale, rivers, Montana State Library/NRIS, Helena, Montana.  
 Soils: 1:250,000 scale, USDA NRCS, STATSGO Database for Montana.



1:1,400,000  
 Miles  
 20 10 0 20  
 20,000 10,000 0 20,000 40,000 Meters



## SOI-2: STATSGO Soils Types Powder River RMP Area

### Legend

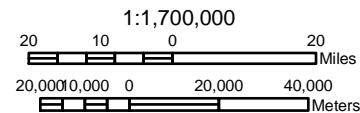
- Highways
- Rivers
- Powder River Geologic Basin Boundary
- Native American Reservations

### Map Unit

MT016	MT152
MT017	MT157
MT019	MT456
MT024	MT161
MT027	MT466
MT029	MT168
MT048	MT474
MT051	MT175
MT054	MT475
MT055	MT187
MT070	MT489
MT075	MT569
MT078	MT224
MT080	MT575
MT083	MT228
MT084	MT597
MT089	MT254
MT092	MT612
MT095	MT259
MT099	MT618
MT102	MT261
MT105	MT668
MT108	MT263
MT109	MT669
MT112	MT264
MT115	MT675
MT117	MT676
MT118	MT679
MT121	MT684
MT124	MT691
MT127	MT693
MT129	MT369
MT132	MT382
MT135	MT694
MT138	MT407
MT141	MT407
MT148	MT414

### DATA SOURCES

Counties: 1:100,000 scale, counties, Montana State Library/NRIS, Helena, Montana.  
 Highways: 1:100,000 scale, roads, Montana State Library/NRIS, Helena, Montana.  
 Reservations: 1:100,000 scale, reservations, Montana State Library/NRIS, Helena, Montana.  
 Rivers: 1:100,000 scale, rivers, Montana State Library/NRIS, Helena, Montana.  
 Soils: 1:250,000 scale, USDA NRCS, STATSGO Database for Montana.



**TABLE SOI-2**  
**SOIL SERIES CHARACTERISTICS FOR POWDER RIVER & BILLINGS RMP AREAS**

STATSGO Map Unit	Major Soil Series	Surface Texture	K-factor <sup>1</sup>	Depth (in)	Slope (%)	Salinity <sup>2</sup> (mmhos/cm)	Permeability (in/hr)
MT421 (4.3 %)	Cambeth	silt loam	0.37	6	4-25		0.6-0.2
	Megonot	silty clay loam	0.37	5	4-15		0.06-0.2
	Manning	loam	0.32	5	8-15		2-6
MT089 (4.3 %)	Cabbart	loam	0.37	3	15-70	0-4	0.6-0.2
	Birney	channery-loam	0.2	5	25-70	0-2	0.6-0.2
	Yamac	loam	0.37	5	15-25		0.6-0.2
MT676 (4.0 %)	Yawdim	silty clay loam	0.37	3	8-35		0.2-0.6
	Delpoint	loam	0.37	3	8-35	0-4	0.6-2
	Thurlow	silty clay loam	0.32	4	0-8		0.6-2
MT675 (3.9 %)	Yawdim	clay loam	0.37	3	8-70		0.2-0.6
	Cabbart	silt loam	0.37	3	15-75	0-4	0.2-0.6
	Thurlow	silty clay loam	0.32	4	2-15		0.2-0.6
MT384 (3.5 %)	Marvan	silty clay	0.37	4	0-8	0-4	0.06-0.2
	Neldore	clay	0.32	3	4-15	0-2	0.06-0.2
	Bascovy	clay	0.37	6	2-15	2-4	0.06-0.2
MT103 (3.0 %)	Cabbart	loam	0.37	3	6-45	0-4	0.6-2
	Delpoint	loam	0.37	3	15-35	0-4	0.6-2
	Yamac	loam	0.37	5	2-8		0.6-2
MT559 (2.9 %)	Tanna	clay loam	0.37	6	2-8		0.06-0.2
	Rentsac	channery-loam	0.2	7	4-15		0.6-2
	Yawdim	clay loam	0.37	3	25-60		0.2-0.6
MT092 (2.9 %)	Cabbart	loam	0.37	3	8-70	0-4	0.6-2
	Delpoint	loam	0.37	3	15-25	0-4	0.6-2
	Yamac	loam	0.37	5	2-8		0.6-2
MT145 (2.8%)	Crago	loam	0.37	4	0-4		0.6-2
	Musselshell	loam	0.37	3	0-2		0.6-2
	Attewan	loam	0.37	6	0-2		0.6-2

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**TABLE SOI-2**  
**SOIL SERIES CHARACTERISTICS FOR POWDER RIVER & BILLINGS RMP AREAS**

STATSGO Map Unit	Major Soil Series	Surface Texture	K-factor <sup>1</sup>	Depth (in)	Slope (%)	Salinity <sup>2</sup> (mmhos/cm)	Permeability (in/hr)
MT084 (2.6 %)	Cabba	silt loam	0.37	3	15-50	0-4	0.6-2
	Ringling	slaty-loam	0.17	5	5-50		0.6-2
	Yawdim	clay loam	0.37	3	8-70		0.2-0.6
MT019 (2.4 %)	Assinniboine	sandy clay loam	0.32	6	2-8		0.6-2
	Pring	sandy loam	0.2	10	2-8		2-6
	Archin	loam	0.43	12	2-8	0-2	0.6-2
MT027 (2.4 %)	Bainville	loam	0.37	4	2-15		0.6-2
	Rock Outcrop	unweathered bedrock	0	60	25-60		0.6-2
						0-2	0.6-2
MT003 (2.3 %)	Absarokee	clay loam	0.32	8	2-50	0-2	0.6-2
	Castner	channery-loam	0.2	6	15-50		0.6-2
	Sinnigam	clay loam	0.37	6	2-15		0.06-0.2
MT048 (2.2 %)	Bitton	channery-loam	0.24	11	25-70	0-2	2-6
	Shambo	loam	0.37	5	0-8		0.6-2
	Doney	loam	0.37	4	2-70	0-2	0.6-2
MT338 (1.6 %)	Lisam	clay	0.37	3	4-35	0-2	0.06-0.2
	Abor	clay	0.37	6	4-15	0-4	0.2-0.6
	Vanda	clay	0.37	4	0-8	2-8	0.01-0.06
MT083 (1.6 %)	Cabba	silt loam	0.37	3	15-50	0-4	0.6-2
	Ringling	slaty-loam	0.17	5	6-50		0.6-2
	Yawdim	clay loam	0.37	3	8-70		0.2-0.6
MT097 (1.5 %)	Cabbart	loam	0.37	3	8-35	0-4	0.6-2
	Rentsac	channery-loam	0.2	7	8-35		2-6
	Delpoint	loam	0.37	3	8-15	0-4	0.6-2
MT164 (1.4 %)	Delpoint	loam	0.37	3	2-15	0-4	0.6-2
	Cabbart	loam	0.37	3	2-35	0-4	0.6-2
	Yamac	Loam	0.37	5	2-15		0.6-2

**TABLE SOI-2**  
**SOIL SERIES CHARACTERISTICS FOR POWDER RIVER & BILLINGS RMP AREAS**

STATSGO Map Unit	Major Soil Series	Surface Texture	K-factor <sup>1</sup>	Depth (in)	Slope (%)	Salinity <sup>2</sup> (mmhos/cm)	Permeability (in/hr)
MT218 (1.3 %)	Shadow	stony-loam	0.1	3	25-60		2-6
	Macfarlane	very stony-loam	0.05	18	25-50		2-6
	Garlet	stony-loam	0.2	4	25-60		0.6-2
MT407 (1.3 %)	Moyerson	silty clay loam	0.32	4	4-50	0-4	0.06-0.2
	Orinoco	silty clay loam	0.32	7	2-15		0.2-0.6
	Rock Outcrop	unweathered bedrock	0	60	0-99		0.2-0.6
MT488 (1.2 %)	Midway	silty clay loam	0.43	3	15-45	2-4	0.2-0.6
	Travessilla Family	silt loam	0.32	2	15-70		0.6-2
	Rock Outcrop	unweathered bedrock	0	60	0-99		0.6-2
MT175 (1.2 %)	Doney	loam	0.37	4	8-70	0-2	0.6-2
	Wayden	silty clay loam	0.37	6	8-35	0-4	0.6-2
	Shaak	clay loam	0.37	6	1-15		0.06-0.2
MT550 (1.2 %)	Sweetgrass	cobbly-clay loam	0.17	4	0-4		0.6-2
	Hilger	cobbly-loam	0.2	5	2-4		0.6-2
	Fairfield	gravelly-clay	0.17	7	2-4		0.6-2
MT167 (1.1 %)	Travessilla Family	fine sandy loam	0.2	2	8-35		2-6
	Delpoint	loam	0.37	3	8-15	0-4	0.6-2
	Cabbart	loam	0.37	3	8-35	0-4	0.6-2
MT680 (1.1 %)	Yawdim	silty clay	0.32	3	4-15		0.06-0.2
	Orinoco	silty clay	0.28	7	4-15		0.2-0.6
	Amherst	clay loam	0.32	5	1-15		0.6-2

## SOILS APPENDIX

**TABLE SOI-2**  
**SOIL SERIES CHARACTERISTICS FOR POWDER RIVER & BILLINGS RMP AREAS**

STATSGO Map Unit	Major Soil Series	Surface Texture	K-factor <sup>1</sup>	Depth (in)	Slope (%)	Salinity <sup>2</sup> (mmhos/cm)	Permeability (in/hr)
MT668 (1.1 %)	Yamac	loam	0.37	5	0-8		0.6-2
	Havre	silty clay loam	0.32	8	0-2	0-2	0.2-0.6
	Birney	channery-loam	0.2	5	15-35	0-2	0.6-2

Source: USDA NRCS State Soil Geographic Database 1996

Note: Only the top 25 Map Units based on total acreage are included ( percent in parenthesis). 58 percent of the soils in the study area are represented.

<sup>1</sup> Soil erosion factor indicates the susceptibility of a soil to sheet and rill erosion. Possible range of values is from 0.02 to 0.69, with higher values being more susceptible to erosion.

<sup>2</sup> Measure of the amount of soluble salts in a soil at saturation, also expressed as electrical conductivity (EC).